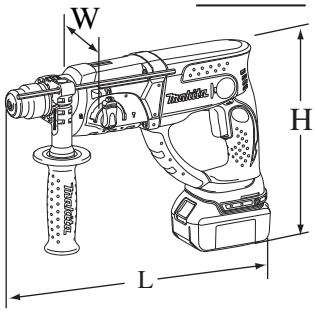
TECHNICAL INFORMATION

PRODUCT

Models No. ► BHR202

Description ► Cordless Combination Hammer



Dimensions: mm (")	
Length (L)	358 (14-1/8)
Width (W)	84 (3-5/16)
Height (H)	259 (10-1/4)

CONCEPT AND MAIN APPLICATIONS

The subject model features 18V Li-ion Battery and 3 mode selection for ensuring an operator its easy handling and versatility.
The highly durable tool head mechanism is the same as AC model HR2470.

These new products are available in the following variations.

Model No.	Battery		Charger	Plastic carrying case
	Type	Quantity		
BHR202RFE	BL1830	2	DC18RA	Yes
BHR202RF		1		Yes
BHR202Z	No	---	No	No

The variations for USA, Canada, Mexico and Panama are as follows.

Model No.	Battery		Charger	Plastic carrying case
	Type	Quantity		
BHR202	BL1830	2	DC18RA	Yes
BHR202Z	No	---	No	No

► Specification

No load speed: (min^{-1}= rpm)		0 - 1,100
Blows per min: (bpm=min^{-1})		0 - 4,000
Max. Output(W)		330
Battery	Voltage: V	18
	Cell and Capacity	Li-ion 3.0 Ah
	Charging Time	approx. 22 min. with DC18RA
Chuck Capacity: mm (")		10 (3/8)
Bit Shank		SDS plus
Capacity : mm (")	Steel	13 (1/2)
	Wood	26 (1)
	* Concrete	20 (13/16)
Operation mode		3 modes (Rotation only/ Rotation with Hammering/ Hammering only)
Variable switch		Yes
Reverse switch		Yes
Clutch (Torque Limiter)		Yes
Electric Brake		Yes
LED Light		Yes
Net Weight: kg (lbs)		3.2 (7.0) including Battery BL1830

* Concrete: 24 (15/16) for North America

► Standard equipment

* Grip Assembly ..... 1 set * Depth Gauge (Stopper Pole) ..... 1 pc.

Note: The standard equipment for the tool shown above may differ by country.

► Optional accessories

* SDS-Plus bits
* Taper shank T.C.T bits
* Taper shank adapter
* Cotter
* Drill chuck assembly
* Drill chuck S13
* Chuck key S13
* Keyless drill chuck
* Grip assembly
* Scraper Assembly
* Cold chisels
* Grooving chisels
* Scaling chisels
* Bull points
* Dust cup set
* Dust cups
* Grease Vessel 30g
* Bit grease
* Blow out bulb
* Safety goggle
* Dust extractor attachment
* Joint 25
* Hose
* Hammer service kit
* Charger DC18RA
* Charger DC18SC
* Charger DC24SA
* Charger DC24SC

► Repair

CAUTION: Remove the bit and the battery from the machine for safety before repair/ maintenance in accordance with the instruction manual!

[1] NECESSARY REPAIRING TOOLS

Code No.	Description	Use for
1R003	Retaining ring S pliers ST-2N	Removing Ring spring 19
1R004	Retaining ring S pliers ST-2	Removing Ring spring 29
1R022	Bearing plate(for arbor press)	Attachment of 1R306 / Removing and Helical gear 25
1R023	Pipe ring (for arbor press)	Removing Helical gear 25
1R032	Bearing setting plate 8.2	Assembling Swash bearing 10
1R033	Bearing setting plate 10.2	Assembling Helical gear 25
1R038	Armature holder 32 set for use with vise	Holding Tool holder complete when removing Ring spring 28 from Tool holder complete
1R164	Ring spring setting tool A	Assembling Oil seal 25 and Needle bearing complete to Gear housing complete
1R165	Ring spring setting tool B	Assembling Needle bearing complete into Gear housing complete
1R212	Tip for Retaining ring pliers	Attachment of 1R003
1R232	Pipe 30	Assembling Oil seal 25 to Gear housing complete
1R252	Round bar for arbor 30-100	Removing Oil seal 25 from Gear housing complete
1R269	Bearing extractor	Removing Ball bearing 608ZZ from Swash bearing section
1R281	Round bar for arbor 7-50	Removing Ring 8 from Cam shaft
1R291	Retaining ring S and R pliers	Removing Retaining Ring S-7 from Cam shaft
1R306	Ring spring removing jig	Removing Ring spring 29 from Tool holder complete
318132-2	Piston cylinder	Assembling Ring spring 28 to Tool holder complete

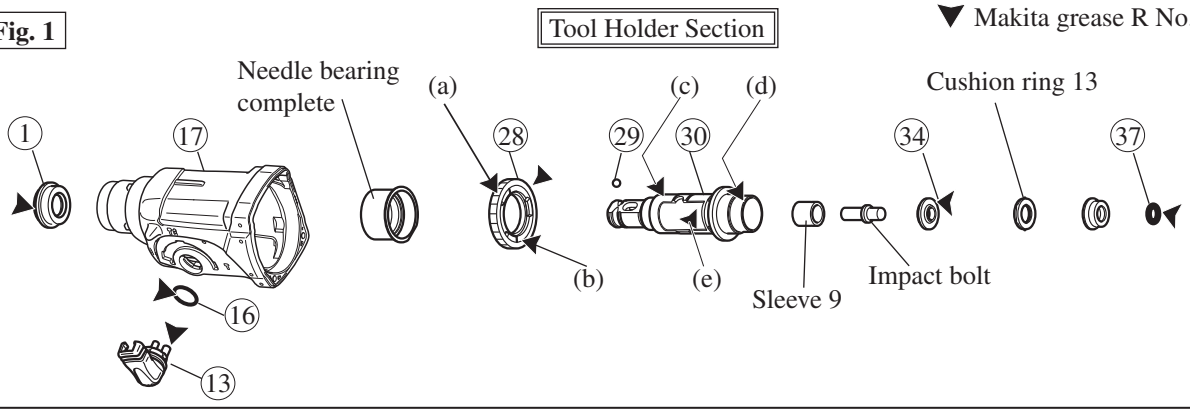
[2] LUBRICATION

Apply the following grease to protect parts and product from unusual abrasion.

* Makita grease R No.00 to the portions marked with black triangle
* Molybdenum disulfide lubricant to the portions marked with gray triangle

Item No.	Description	Portion to lubricate	Lubricant	Amount
(1)	Cap 35	Lip portion where Bit is inserted	Makita grease R No. 00	a little
(13)	Change lever	Pin portion		
(16)	O ring 17	Whole portion		
(17)	Gear housing complete	Inside where Swash bearing section rotates		
(28)	Spur gear 51	(a) Teeth portion, (b) Surface where Clutch portion of (30) Tool holder complete contacts		
(29)	Steel ball 7	Whole portion		
(30)	Tool holder complete	(c) Surface where Needle bearing complete contacts		
		(d) Surface where Plane bearing 28 of (63)Inner housing complete contacts		
		(e) Inside where (41) Piston cylinder reciprocates		
(34)	Ring 10	Surface where Cushion ring 13 contacts		
(37)	O ring 9	Whole portion		

Fig. 1

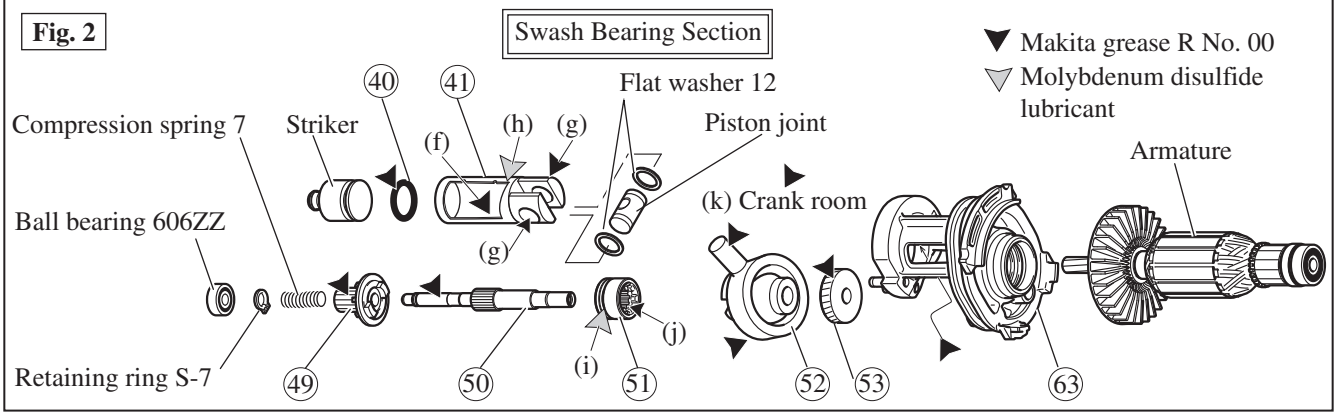


Repair

[2] LUBRICATION (cont.)

Item No.	Description	Portion to lubricate	Lubricant	Amount
㊵	O ring 16	Whole portion	Makita grease R No. 00	a little
㊶	Piston cylinder	(f) Inside where Striker moves		
		(g) Hole for accepting Piston joint		
		(h) Surface where ㉚ Tool holder complete contacts. (Refer to **Fig. 1**.)	Molybdenum disulfide lubricant	
㊾	Spur gear 10	Gear teeth where ㉘ Spur gear 51 engages (Refer to **Fig. 1**.)	Makita grease R No. 00	
㊿	Cam shaft	Surface where ㊶ Clutch cam and ㊾ Spur gear 10 contact		
㊶	Clutch cam	(i) Outside groove	Molybdenum disulfide lubricant	
		(j) Side where ㊷ Swash bearing 10 engages	Makita grease R No. 00	
㊷	Swash bearing 10	Pole portion which is inserted into Piston joint		
		Bearing portion		4g
㊸	Helical gear 25	Teeth portion		17g
㊸	Inner housing complete	Space where Armature's drive end and ㊸ Helical gear 25 engages		a little
⑰	Gear housing complete	(k) Crank room		5g

Fig. 2



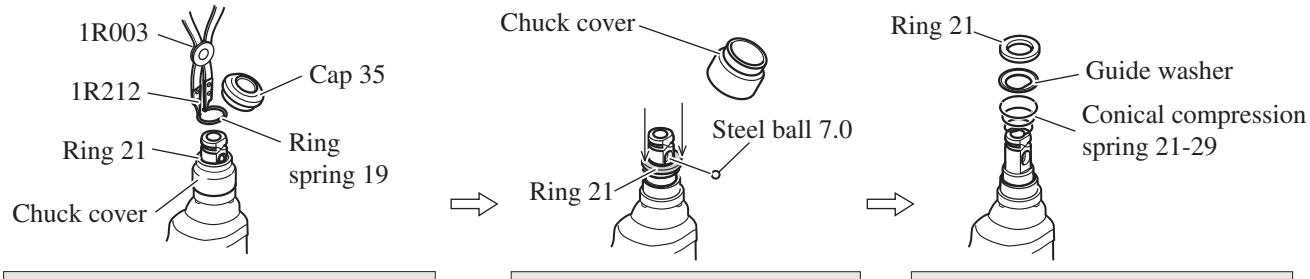
[3] DISASSEMBLY/ASSEMBLY

[3] -1. Tool Holder Section

DISASSEMBLING

Disassemble Tool holder section as illustrated in **Fig. 3**.

Fig. 3



Disassemble Cap 35 and remove Ring spring 19 with 1R003 and 1R212.
Note: Replace the tips of 1R003 to those of 1R212.

Disassemble Chuck cover. And remove Steel ball 7.0 while pressing down Ring 21.

After disassembling Steel ball 7.0, the Tool holder section can be disassembled as illustrated above.

ASSEMBLING

Do the reverse of the disassembling step. Refer to **Fig. 3**.
Note: Be sure to place the flat portion of Ring spring 19 on Steel ball 7.0.

Repair

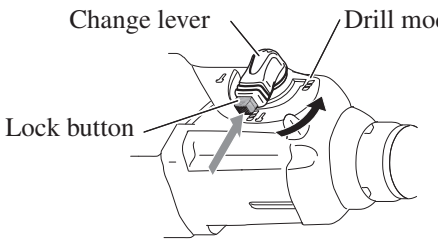
[3] DISASSEMBLY/ASSEMBLY

[3] -2. Change Lever

DISASSEMBLING

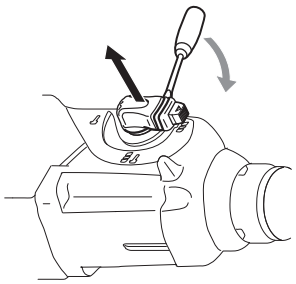
Disassemble Change lever as illustrated in **Figs. 4 and 5.**

Fig. 4



Pushing Lock button into Change lever, turn Change lever fully to Drill mode until it stops.

Fig. 5

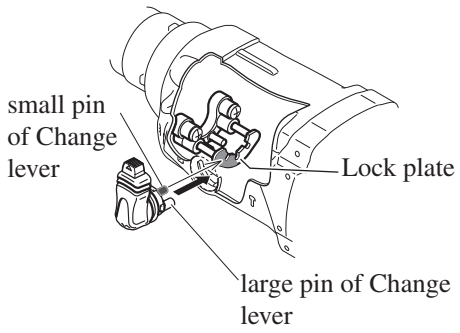


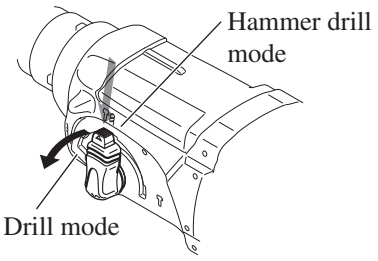
Remove Change lever by levering up it with Slotted head screwdriver, inserted between Gear housing complete and Change lever.

ASSEMBLING

1) Assemble Change lever to Gear housing complete in the order of **Figs. 6 and 7**.
2) Make sure that Change lever stops at every operation mode exactly after assembling.

Fig. 6

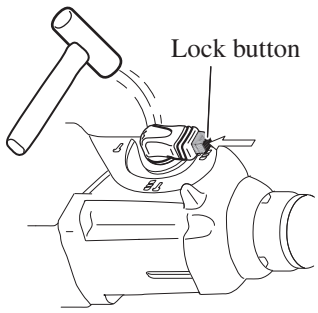




Lock plate can be seen through the hole for Change lever insertion before mounting Change lever.
When inserting Change lever into Gear housing complete, contact the small pin to this Lock plate as designated in gray color. Change lever can be inserted in Hammer drill mode.

Pushing Lock button into Change lever, turn Change lever fully to Drill mode until it stops.

Fig. 7



Pushing Lock button into Change lever, tap Change lever.
Change lever can be assembled to Gear housing complete.

Repair

[3] DISASSEMBLY/ASSEMBLY

[3] -4. Armature

DISASSEMBLING

1) Remove Holder cap cover by inserting Slotted screwdriver between Holder cap cover and Motor housing complete. (**Fig. 8**) Then remove Holder cap and Carbon brushes.
2) Seperate Gear housing complete from Motor housing complete by loosening 4x40 Tapping screws (4 pcs.). Armature is left on Gear housing complete in this step. (**Fig. 9**)
3) Pull Armature out from Gear housing complete by hand. (**Fig. 10**) This way is easier than using Plastic hammer to strike Gear housing portion. (Ball bearing 6000DDW of Armature is tightly fit into the bearing room in Gear housing complete using O ring 26.)

Fig. 8

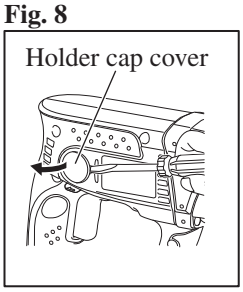


Fig. 9

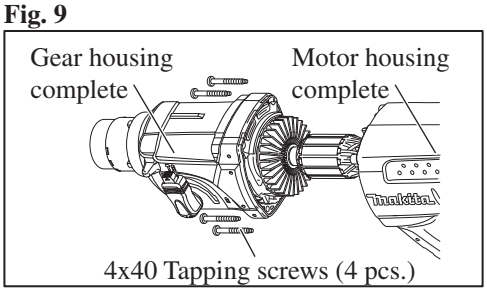
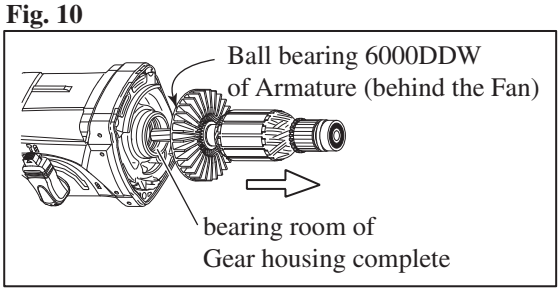


Fig. 10



ASSEMBLING

Do the reverse of the disassembling step.

[3] -5. Torque Limiter Section

DISASSEMBLING

1) Disassemble Tool holder section as illustrated in **Fig. 3**.
2) Disassemble Change lever as illustrated in **Figs.4 and 5.**
3) Separate Gear housing complete from Motor housing. Then remove Armature from Gear housing complete. **(Figs. 8 to 10**)
4) Disassemble Torque limiter section as illustrated in **Figs. 11 and 12**.
5) Remove the Ring spring 29 to separate Washer 31, Compression spring 32 and Spur gear 51 (**Figs. 13 and 14**)

Fig. 11

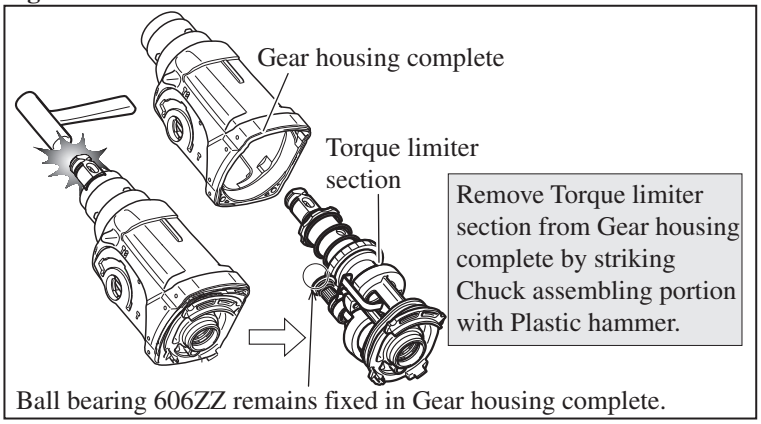


Fig. 12

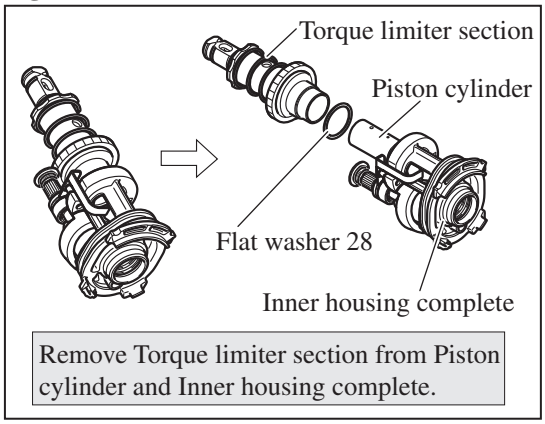


Fig. 13

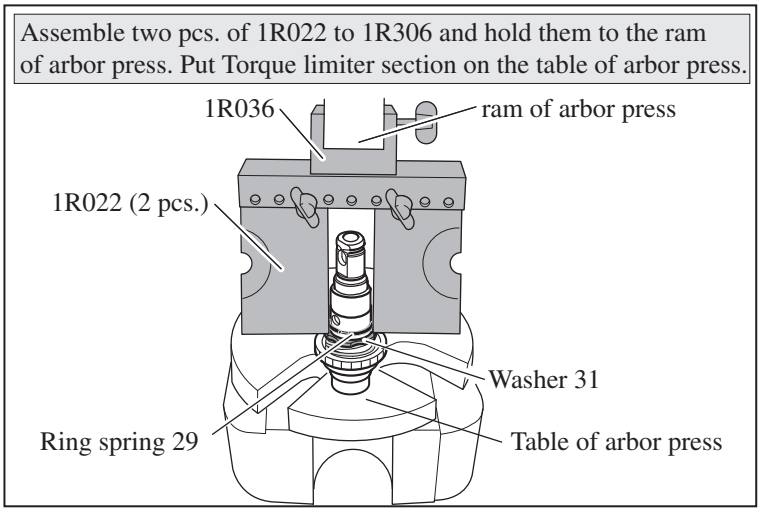
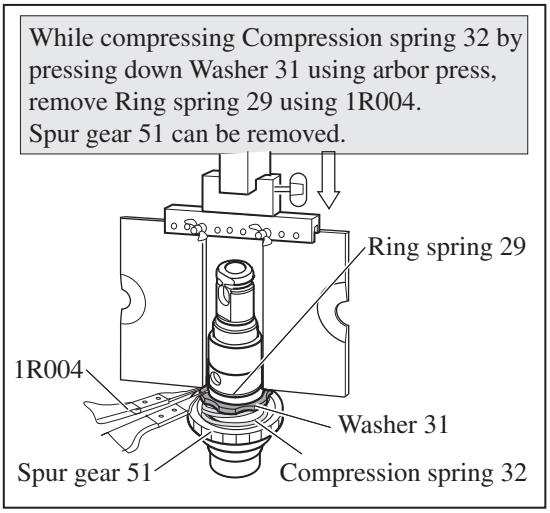


Fig. 14



Repair

[3] DISASSEMBLY/ASSEMBLY
[3] -5. Torque Limiter Section (cont.)

ASSEMBLING

Do the reverse of disassembling steps.
Note: Do not forget to assemble Flat washer 28 between Torque limiter section and Inner housing complete. Refer to **Fig. 12**.

[3] DISASSEMBLY/ASSEMBLY
[3] -6. Needle Bearing Complete and Oil Seal 25

DISASSEMBLING

1) Disassemble Torque limiter section and Inner housing complete from Gear housing complete.
   See Disassembly of **[3] -5. Torque Limiter Section.**
2) Insert Inner housing complete into Gear housing complete. (**Fig. 15**)
3) Remove Needle bearing complete and Oil seal 25. (**Fig. 16**)

Fig. 15

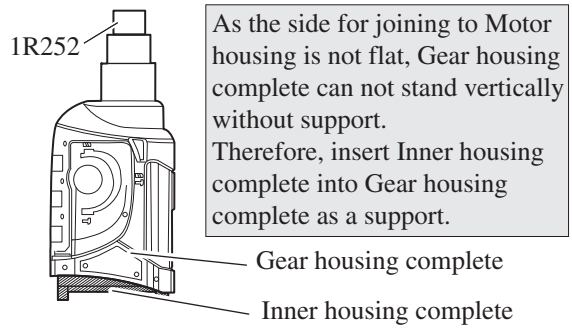
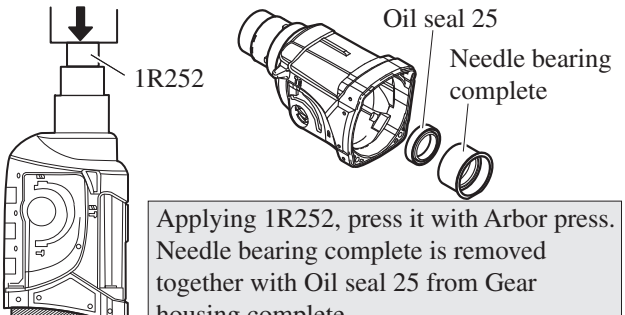


Fig. 16



ASSEMBLING

1) Assemble Oil seal 25 to Gear housing complete in the order of **Figs. 17 and 18.**
2) Assemble Needle bearing complete as illustrated in **Figs. 19 and 20**.

Fig. 17

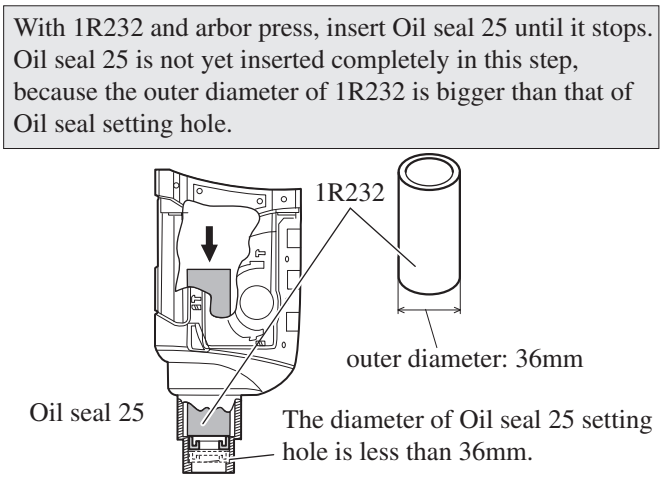


Fig. 18

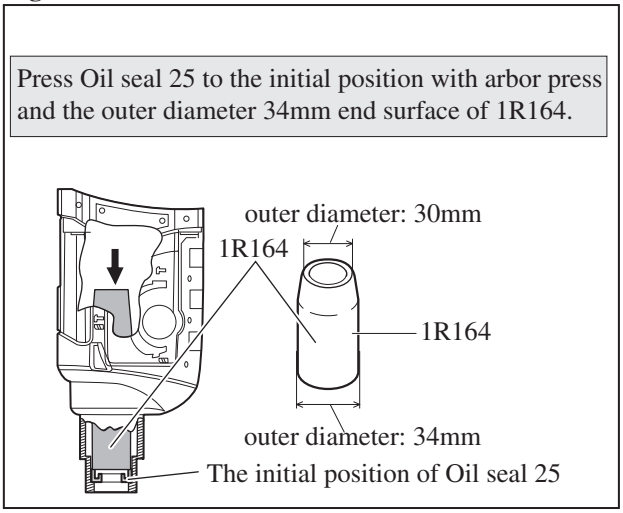


Fig. 19

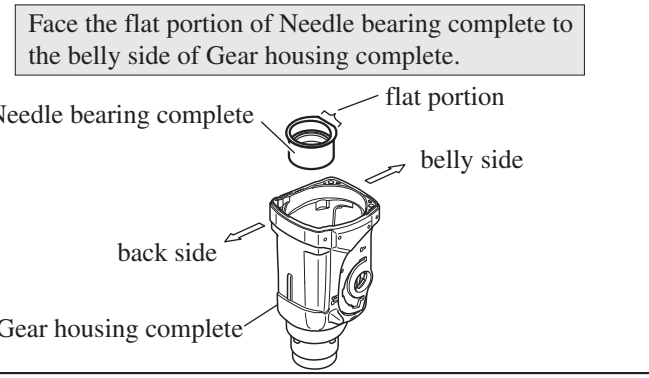
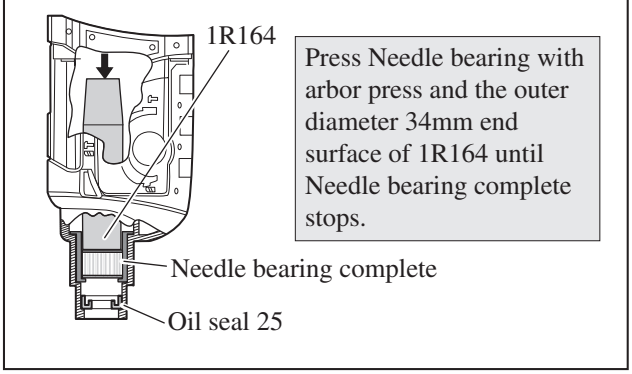


Fig. 20



Repair

[3] DISASSEMBLY/ASSEMBLY

[3] -7. Impact Bolt Section

DISASSEMBLI NG

1) Referring to "**[3] -5. Torque Limiter Section**", disassemble Ring spring 29, Washer 31, Compression spring 32 and Spur gear 51 from Tool holder complete. Refer to **Figs. 11 to 14**.
2) Holding Gear housing complete in vise and 1R038, Tap Ring spring 28 in Tool holder complete as illustrated in **Figs. 21 and 22.**
3) Remove Ring spring 28 from Tool holder complete and disassemble Impact bolt section. (**Figs. 23 to 24**)

Fig. 21

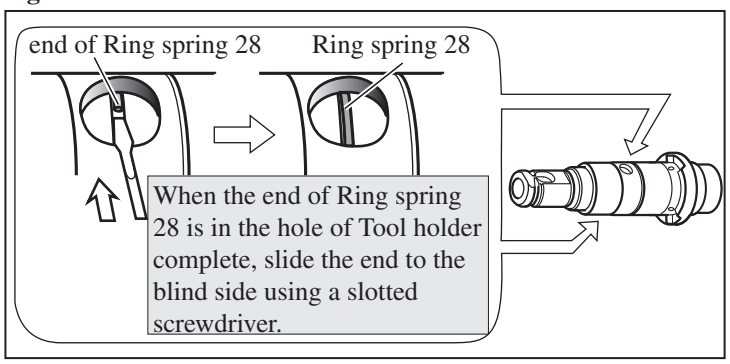


Fig. 23

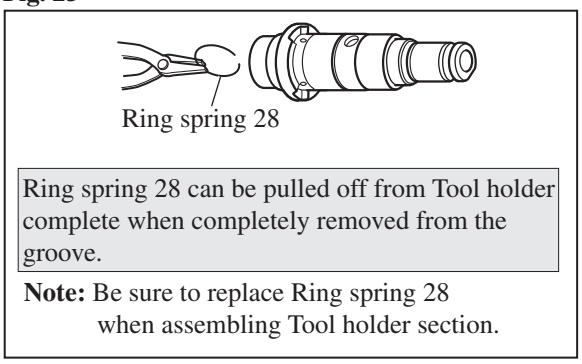


Fig. 22

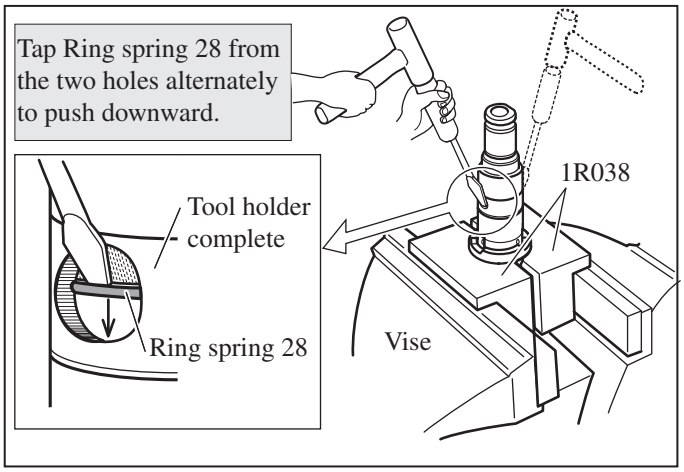
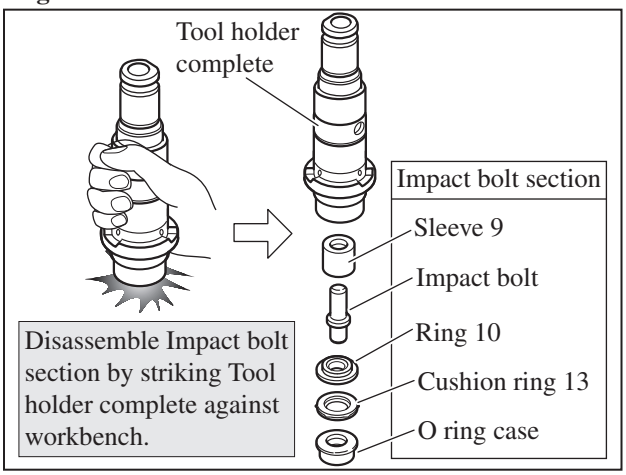


Fig. 24



ASSEMBLING

1) Referring to **Figs. 25, 26 and 27** assemble the Impact bolt section to Tool holder complete as illustrated in **Fig. 28**.

Fig. 25

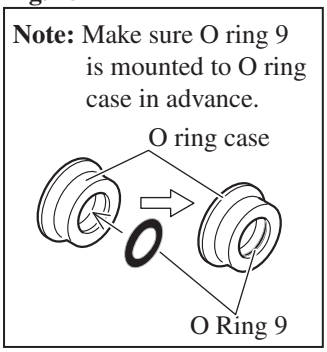


Fig. 26

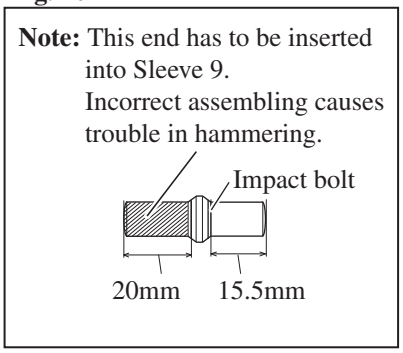


Fig. 27

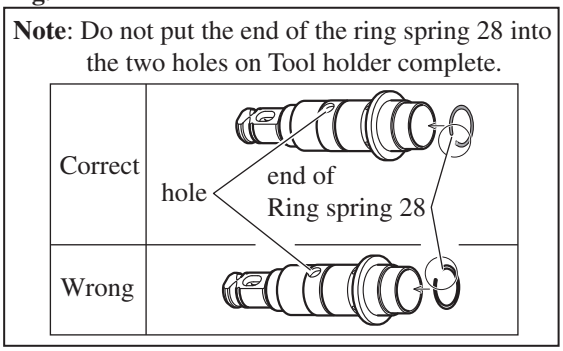
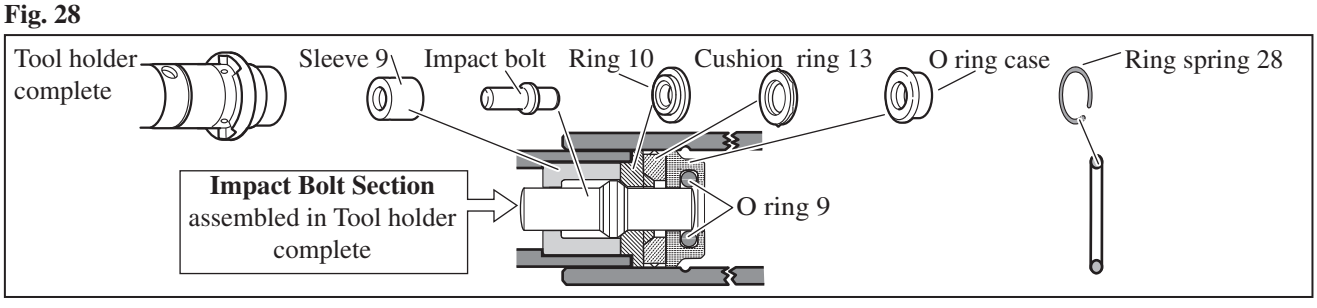


Fig. 28



Repair

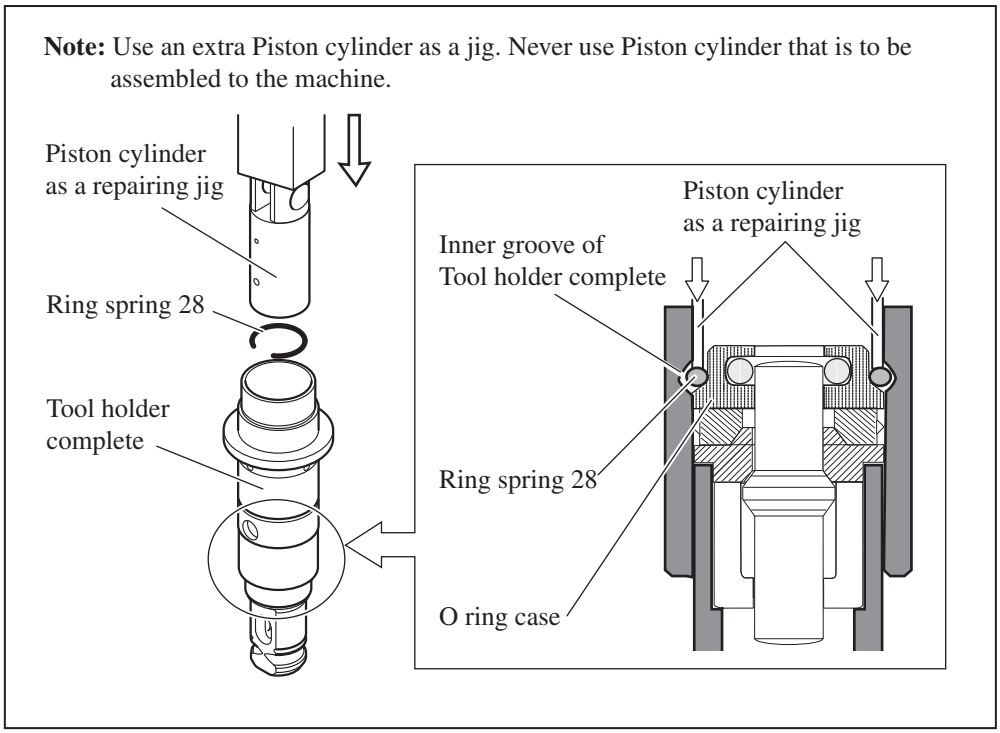
[3] DISASSEMBLY/ASSEMBLY

[3] -7. Impact Bolt Section (cont.)

ASSEMBLING

2) Push Ring spring 28 with Piston cylinder until it fits to the inner groove of Tool holder complete. (**Fig. 29**)

Fig. 29



[3] -8. Swash Bearing Section

DISASSEMBLING

1) Disassemble Tool holder section as illustrated in **Fig. 3**.
2) Disassemble Change lever as illustrated in **Figs. 4 and 5.**
3) Separate Gear housing complete from Motor housing complete. And then, remove Armature from Gear housing complete. (Refer to **Figs. 8 to 10**.)
4) Remove Stop ring E-4, Flat washer 5 and Compression spring 6 from pin of Inner housing complete. (**Fig. 30**)
5) Remove two M4x12 Hex socket bolts that fasten Bearing retainer to Inner housing complete. (**Fig. 31**)

Fig. 30

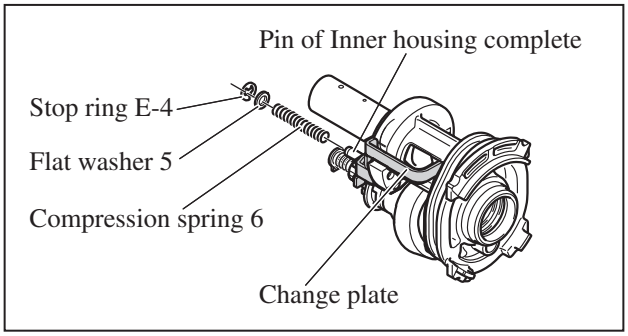
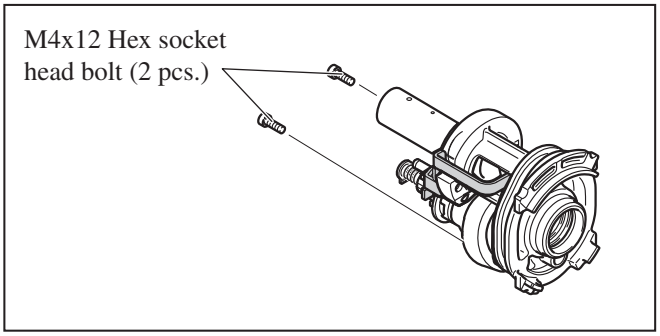


Fig. 31



Repair

[3] DISASSEMBLY/ASSEMBLY

[3] -8. Swash Bearing Section (cont.)

DISASSEMBLING

6) Move Piston cylinder to the rear dead center position (**Fig. 32**).
7) Remove Swash bearing section from Inner housing by pulling in the direction of the arrow. Then, remove Change plate from the groove of Clutch cam. (**Fig. 33**).

Fig. 32

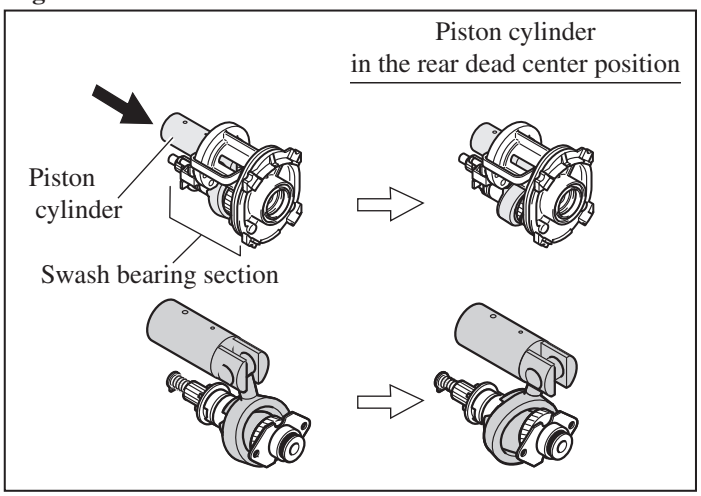
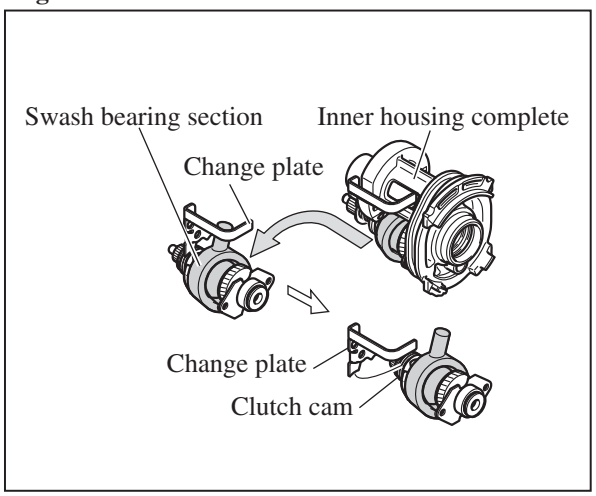
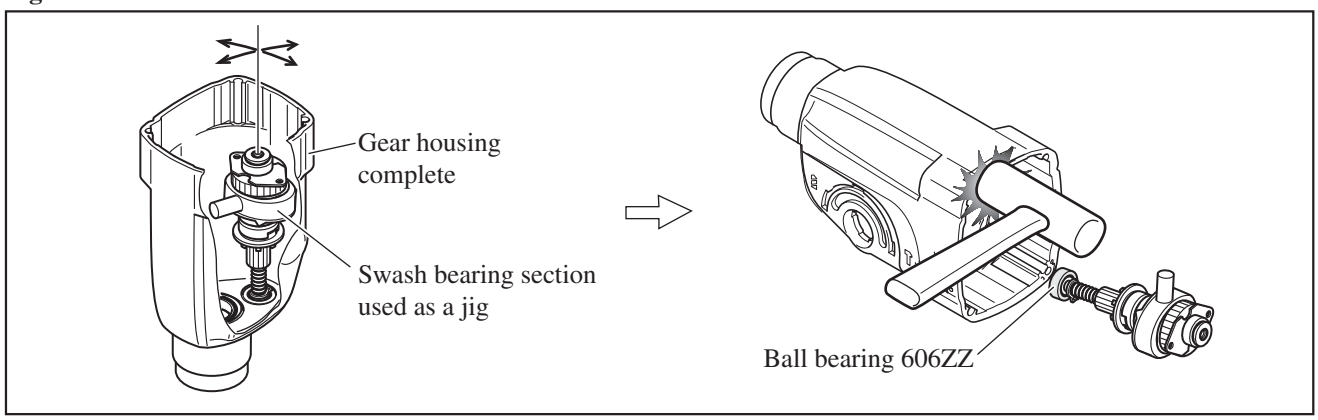


Fig. 33



8) Remove Ball bearing 606ZZ from Gear housing complete using the removed Swash bearing section as a jig as follows;
* Insert Cam shaft of Swash bearing section into the Ball bearing again.
* Tilt the Ball bearing a little bit by moving Swash bearing section as illustrated to l**eft in Fig. 34**.
* Ball bearing 606ZZ can now be removed by lightly tapping the edge of Gear housing complete with plastic hammer as illustrated to **right in Fig. 34.**

Fig. 34



9) Remove Ring 8 using 1R022, 1R023, 1R281 and arbor press as illustrated in **Fig. 35**.
10) Remove Ball bearing 608ZZ using 1R269. Flat washer 8 and Bearing retainer can now be removed by hand. (**Fig. 36**)

Fig. 35

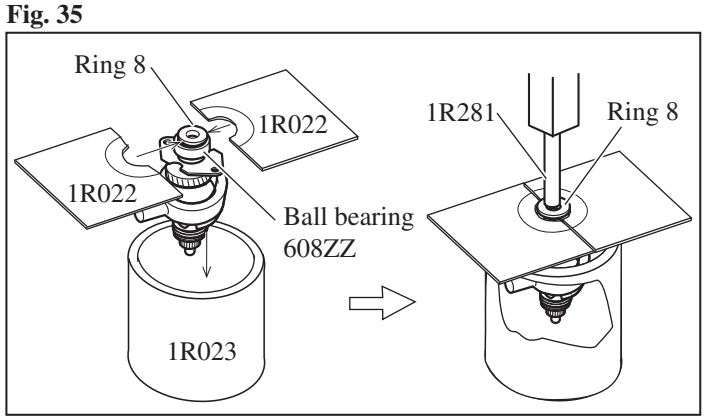
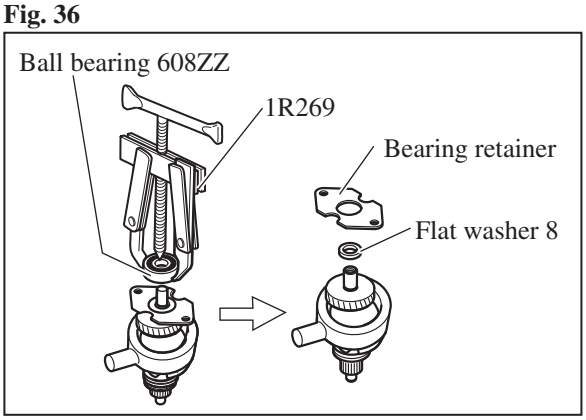


Fig. 36



Repair

[3] DISASSEMBLY/ASSEMBLY
[3] -8. Swash Bearing Section (cont.)

DISASSEMBLING

11) Remove Helical gear 26 using 1R022, 1R023 and 1R281.
as illustrated to left in **Fig. 37**. Swash bearing 10 and Clutch cam can now be removed by hand (**right in Fig. 37**).
12) Remove Retaining ring S-7 using 1R291 (**left in Fig. 38**). Compression spring 7 and Spur gear 10 can now be removed by hand. (**right in Fig. 38**).

Fig. 37

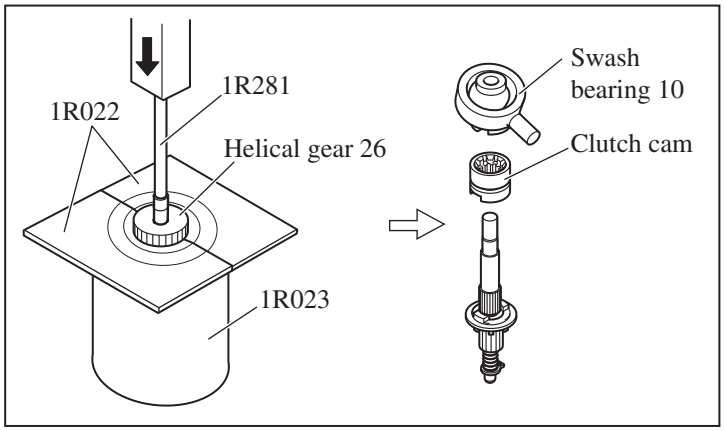
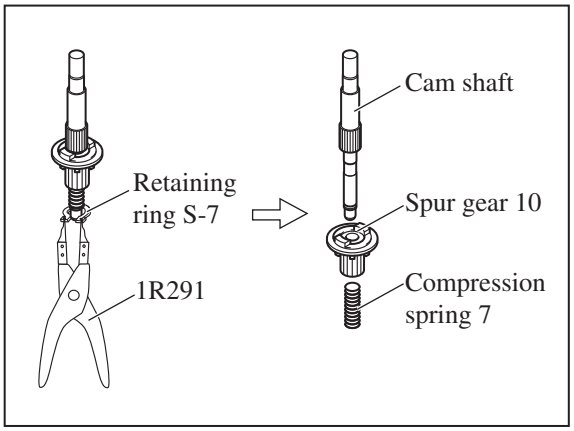


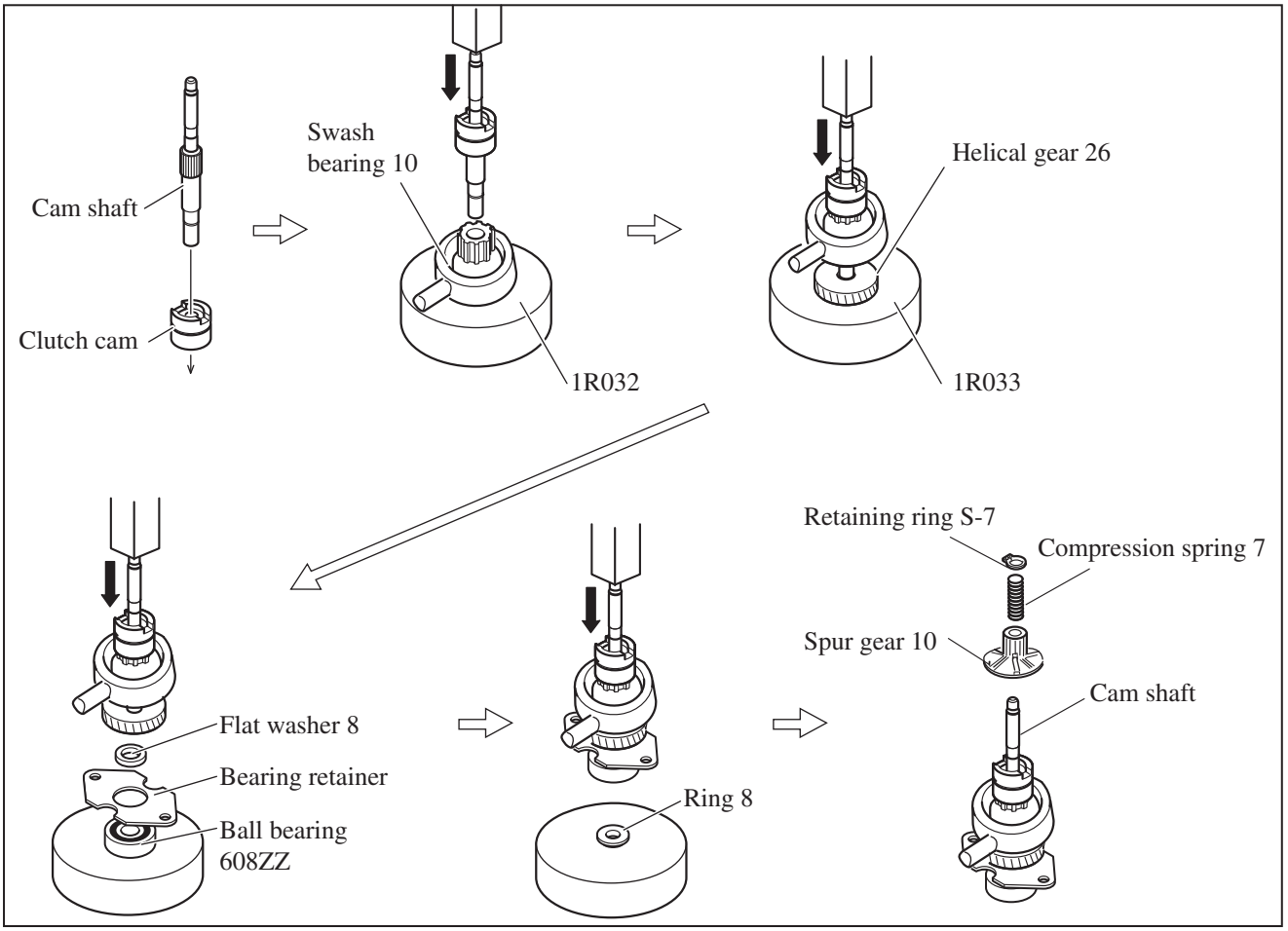
Fig. 38



ASSEMBLING

1) Assemble Swash bearing section using 1R032, 1R033, 1R291 and arbor press as illustrated in **Fig. 39**.
Note: Be sure to put Flat washer 8 in place, or else Bearing retainer will be clamped between Ball bearing 608ZZ and Helical gear 26.

Fig. 39



Repair

[[3] DISASSEMBLY/ASSEMBLY

[3] -8. Swash Bearing Section (cont.)

ASSEMBLING

2) Assemble Piston joint and two Flat washers 12 to Piston cylinder as illustrated in **Fig. 40**.
Note: Do not forget to apply Makita grease R No.00. Refer to **Fig. 2.**
3) Insert Piston cylinder into Inner housing complete. (**Fig. 41**).

Fig. 40

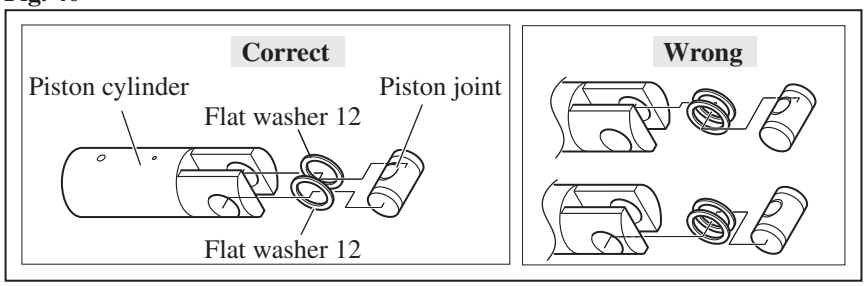
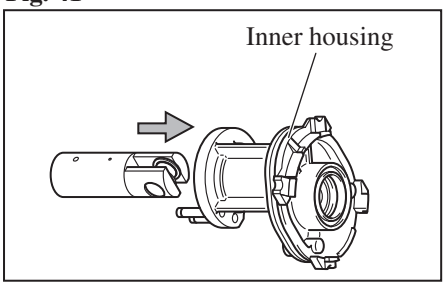


Fig. 41



4) Move Piston cylinder to the rear dead center position. (**Fig. 42**)
5) Insert the pole of Swash bearing 10 into the hole of Piston joint as illustrated in **Fig. 43**.

Fig. 42

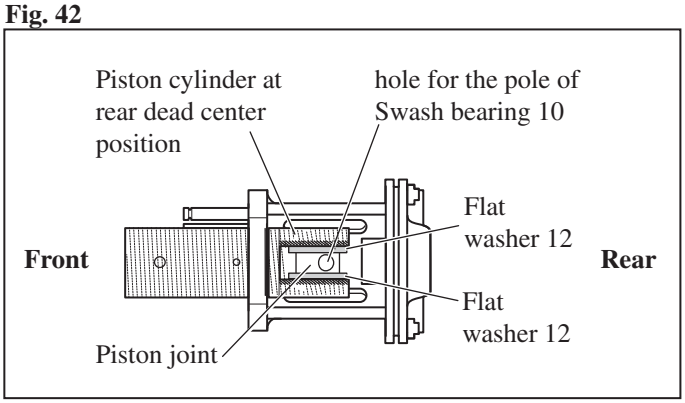
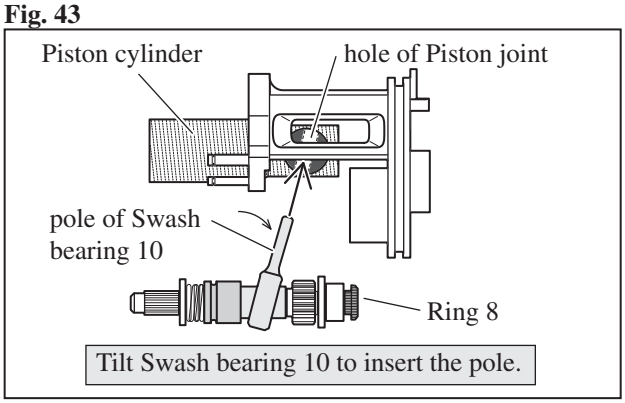


Fig. 43



6) Insert Ring 8 (the end of Swash bearing section) into Inner housing complete. (**Fig. 44**)
7) Fitting the tip of Change plate in the groove on Clutch cam, insert Change plate over the pins of Inner housing complete. (**Fig. 45**)
Note: Ball bearing 608ZZ of Swash bearing section is not yet inserted into Inner housing complete in this step.

Fig. 44

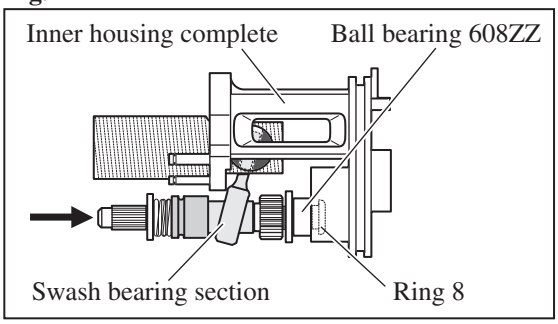
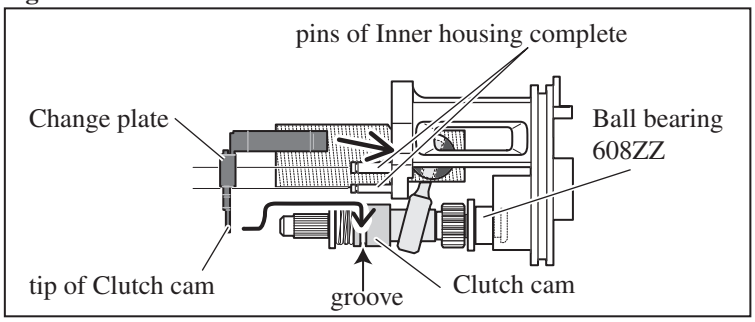
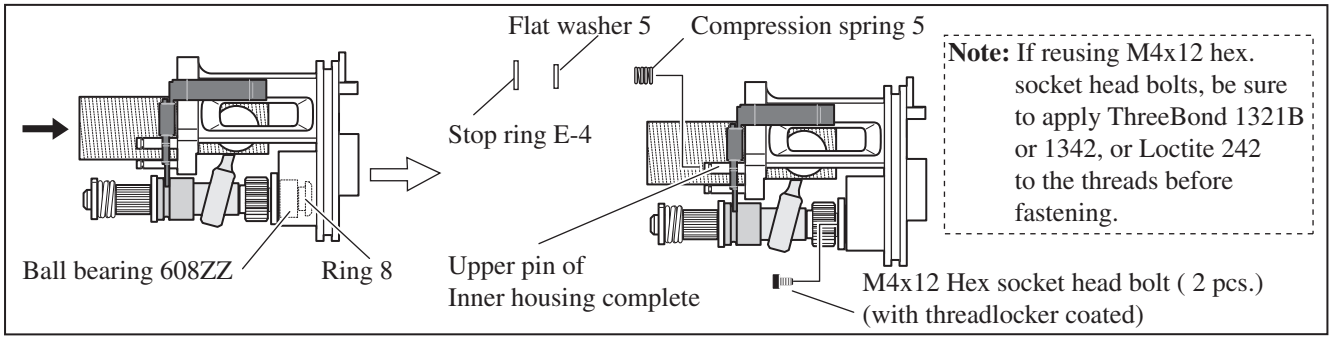


Fig. 45



8) Insert Ball bearing 608ZZ of Swash bearing section into Inner housing complete, and fasten Swash bearing section to Inner housing complete with two M4x12 hex socket head bolts. Then, put Compression spring 6 and Flat washer 5 through the upper pin of Inner housing complete, and secure them with Stop ring E-4 (**Fig. 46**)

Fig. 46



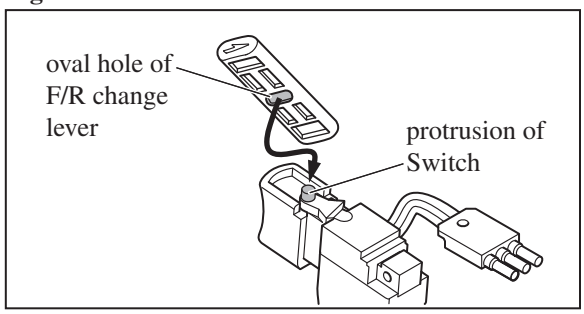
Repair

[3] DISASSEMBLY/ASSEMBLY
[3]-9. F/R Change Lever

ASSEMBLING

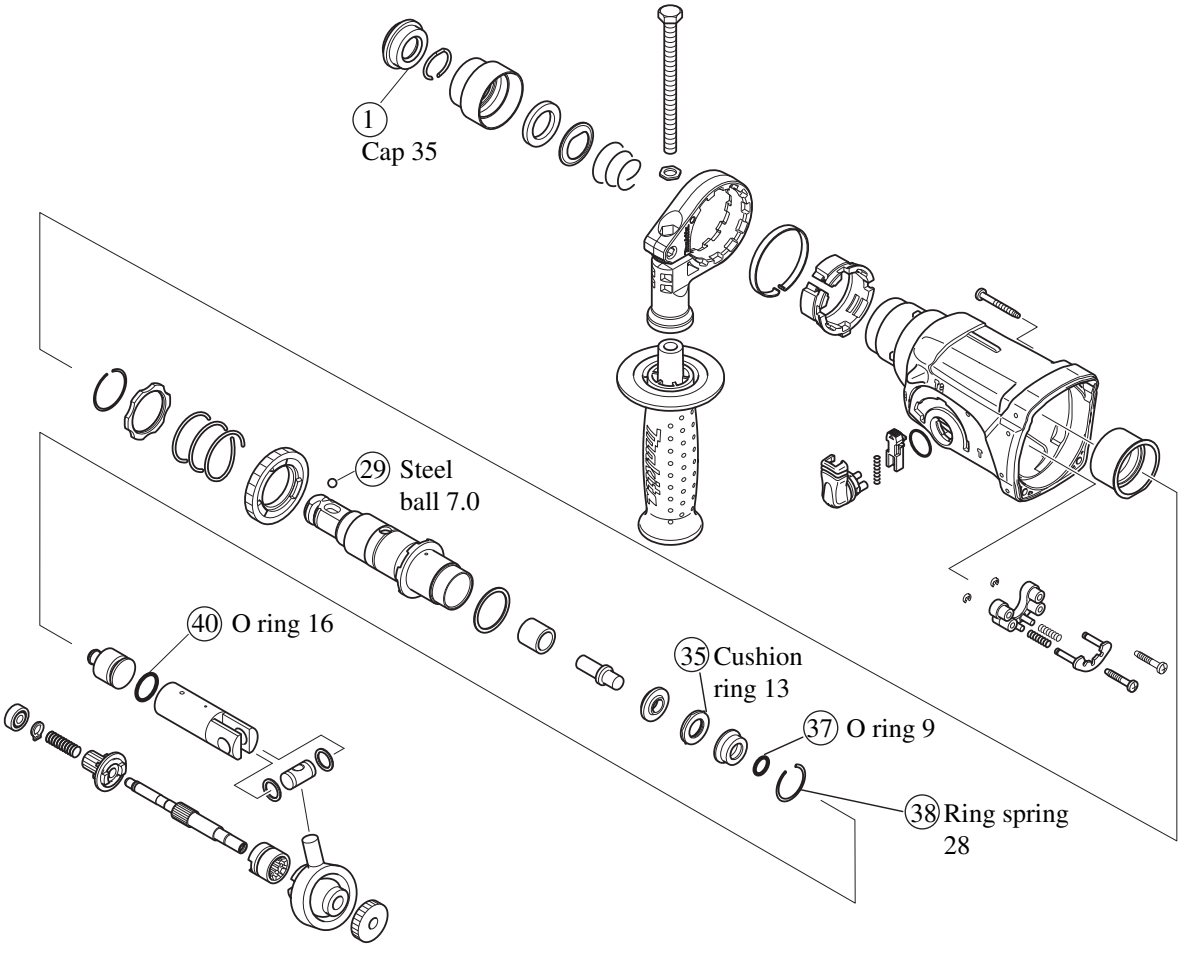
Fit the protrusion of Switch into Oval hole of F/R change lever and assemble them to Housing L. F/R change lever is symmetric between right and left, therefore, it is not directional. (**Fig. 47**)

Fig. 47



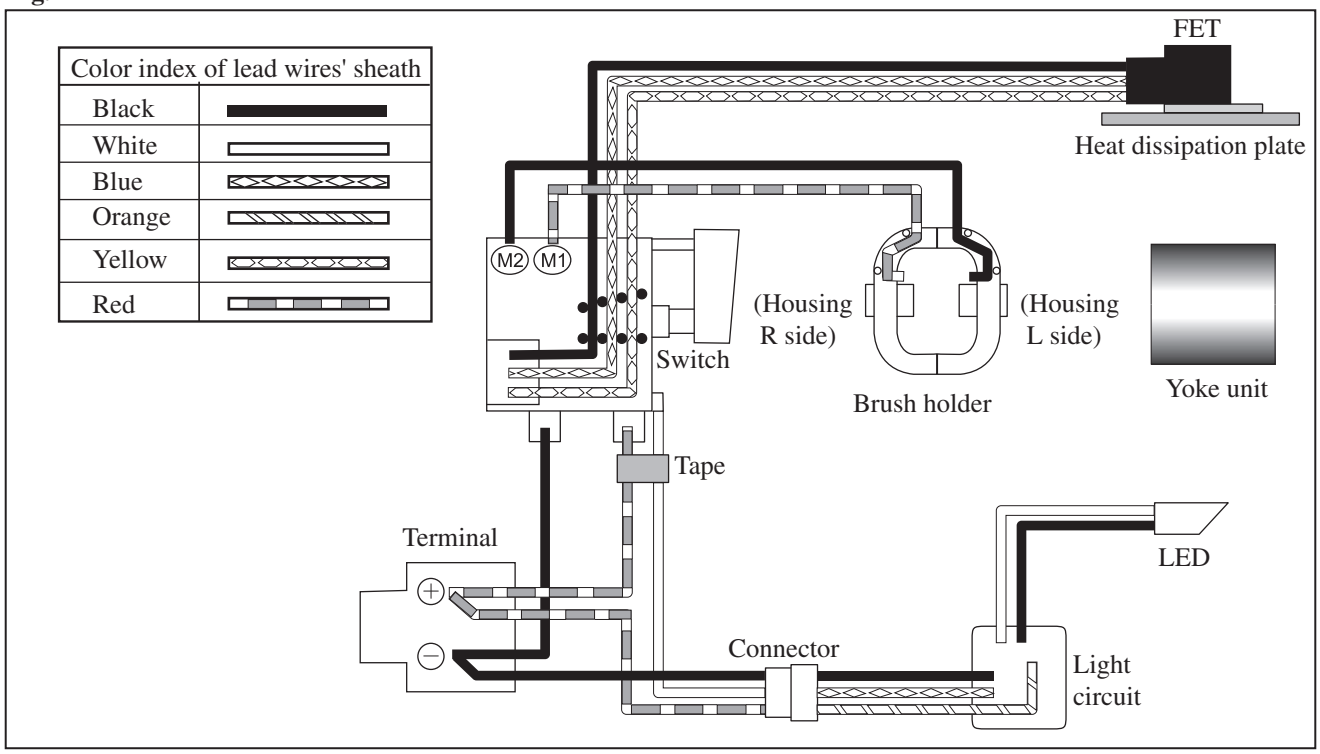
Maintenance program

It is recommended to replace the following parts shown below and apply lubricant to the specific parts designated in **Figs. 2 and 3** when replacing Carbon brushes.



Circuit diagram

Fig. D-1



Wiring diagram

Fig. D-2